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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/605,513	10/05/2003	Chen Ou	KYCP0011USA	2512

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EXAMINER	
MONDT, JOHANNES P	
ART UNIT	**PAPER NUMBER**
2826	

DATE MAILED: 11/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/605,513	OU ET AL.
	Examiner	Art Unit
	Johannes P Mondt	2826

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-5,7-12 and 14-18* is/are rejected.

7)☒ Claim(s) *2,6 and 13* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 October 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(b) because they are incomplete. 37 CFR 1.83(b) reads as follows:

> When the invention consists of an improvement on an old machine the drawing must when possible exhibit, in one or more views, the improved portion itself, disconnected from the old structure, and also in another view, so much only of the old structure as will suffice to show the connection of the invention therewith.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. In particular, the first conductivity type cladding layer is not shown in connection with the embodiment of Figure 2, yet claim 15 includes a limitation on said first conductivity type cladding layer (N.B.: the first conductivity type contact layer is defined as 16 in Figure 1, and is defined as 46 in Figure 2 in section [0018]).

Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to

obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. ***Claims 1, 3 and 4*** are rejected under 35 U.S.C. 102(b) as being anticipated by Chen et al (USPAT 6,207,972 B1). *Chen et al teach* a light emitting diode (cf. title) (LED) comprising:

a substrate **20** (col. 5, l. 15 and Figure 4);

a light emitting stacked structure **30** (i.e., stack **3a/3b/3c**) (col. 5, l. 15-25) formed over the substrate;

a dual dopant contact layer **6a** (col. 5, l. 39) formed over the light emitting stacked structure (cf. Figure 4), the dual dopant contact layer comprising a plurality of p-type dopants and a plurality of n-type dopants (col. 5, l. 38-44) (N.B.: in light of the Specification said plurality of n-type dopants and said plurality of p-type dopants are plurality of actual atoms c.q. ions, rather than dopant atom/ion chemical type (see section [0020] of Applicant's Specification); and

a transparent conductive oxide layer **6b** (see, e.g., abstract and title on transparent ZnO (zinc oxide, which is inherently transparent but also cited to be transparent in col. 5, l. 37) window layer; also, col. 5, l. 37-49) formed over the dual dopant contact layer 6a (cf. Figure 4).

In conclusion, Chen et al anticipate claim 1.

On claim 3: In reference to the claim language referring to "formed by adding the p-type dopants and the n-type dopants together through an epitaxy growth" in this claim, intended use and other types of functional language must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In re Casey, 152 USPQ 235 (CCPA 1967); Also: In re Otto, 136 USPQ 458, 459 (CCPA 1963). Therefore, the further limitation as defined by claim 3 does not distinguish over the prior art.

On claim 4: In reference to the claim language referring to "formed by through a cooling rate less than 40 C /min" in this claim, intended use and other types of functional language must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In re Casey, 152 USPQ 235 (CCPA 1967); Also: In re Otto, 136 USPQ 458, 459 (CCPA 1963). Therefore, the further limitation as defined by claim 4 does not distinguish over the prior art.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. ***Claims 5 and 8-11*** are rejected under 35 U.S.C. 103(a) as being unpatentable over Furukawa et al (5,981,977) in view of Chen et al (6,207,972 B1). *Furukawa et al teach* (cf. Figure 6) a light emitting diode (LED) (diode being the essence of the p-(i-)n structure of the light emitting layer (in this case a MQW) in the light emitting element as taught by Furukawa et al (cf. title, abstract and Figure 6, as well as col. 9, l. 64 – col. 10, l. 30, which in its turn refers to col. 4, l. 22-64 for numerals first introduced in Figure 1 and re-used for Figure 6)) comprising:

an insulating substrate **12** (col. 4, l. 26-35; sapphire is inherently insulating);

a buffer layer **14** (col. 4, l. 29-37) formed over the insulating substrate (cf. Figure 6A);

a first conductivity type (n-type) contact layer **16** (col. 4, l. 29-37) formed over the buffer layer (cf. Figure 6A), the first conductivity type contact layer comprising a first upper surface (left hand side portion of stepped upper main surface of 16; cf. Figure 6A) and a second upper surface (right hand side portion of stepped upper main surface of 16; cf. Figure 6A);

a multiple quantum well light emitting layer **26** (col. 10, l. 10-12) formed over the first upper surface; cf. Figure 6A);

a second conductivity type (p-type) contact layer **44** (cf. col. 4, l. 55-58 and col. 10, l. 21-23) formed over the multiple quantum well light emitting layer (cf. Figure 6A);

a second conductivity type (p-type) electrode **52** (col. 6, l. 60-62) formed over the second conductivity type contact layer; and

a first conductivity type (n-type) electrode **50** (col. 4, l. 59-64) formed over the second upper surface(col. 4, l. 59-64).

Furukawa et al do not necessarily teach the further limitations of (a) the dual dopant contact layer as claimed, nor do they teach (b) the transparent conductive oxide layer as claimed.

However, it would have been obvious to include further limitation ad (a) and ad (b) *in view of Chen et al*, who, in a patent on a light emitting diode teach the inclusion of a transparent window layer (cf. title) wherein, for the specific purpose of increasing the light brightness (cf. abstract) and thus the efficiency of the light-emitting diode:

Ad (a): a dual dopant contact layer **6a** (col. 5, l. 37-48) formed over a second conductivity type (p-type) contact layer 80 (N.B.: layer 80 qualifies materially and structurally as p-type contact layer by virtue of being heavily p-doped, making more gradual the contact to fully conductive portions that inevitably are overhead, namely electrodes), the dual dopant contact layer comprising a plurality of p-type dopants and a plurality of n-type dopants (col. 5, l. 38-44) (N.B.: in light of the Specification said plurality of n-type dopants and said plurality of p-type dopants are plurality of actual

atoms c.q. ions, rather than dopant atom/ion chemical type (see section [0020] of Applicant's Specification) ; and

Ad (b): a light transmitting (i.e., transparent) conductive oxide layer **6b** (cf. col. 5, l. 26-49) formed over said dual contact layer 6a (cf. Figure 6A).

Motivation to include the teaching by Chen et al in this regard in the invention by Furukawa et al derives from the increased light brightness through the inclusion of the transparent conductive oxide layer as specifically explained by Chen et al (cf. abstract), and, furthermore, through the inclusion of the dual dopant ("transition" layer 6a so as to reduce contact resistance, as also specifically explained by Chen et al (cf. abstract). *Combination* of said teaching with said invention by insertion of layers 6a and 6b between layers 44 and 52 of Furukawa et al in the vertical order according to Chen et al.

On claim 8: the LED by Furukawa et al further comprises a first conductivity type (n-type) cladding layer **24** (col. 10, l. 7-10) interposed between the first conductivity type contact layer **16** (cf. Figure 6B) and the multiple quantum well light emitting layer **26** (col. 10, l. 7-12 and Figure 6B), and the first conductivity type cladding layer **24** is made of $Al_xGa_{1-x}N$ (inherently the stoichiometric coefficients of the Group III elements must add to the stoichiometric coefficient of N to achieve lowest order neutrality and chemical stability), and $0 \leq x \leq 1$ (the latter double inequality does not imply any material limitation at all, merely indicating the relative abundances of Al and Ga).

On claim 9: the LED by Furukawa et al further comprises a second conductivity type (p-type) cladding layer **28** (col. 10, l. 7-10) interposed between the second

conductivity type contact layer **44** (cf. Figure 6B) and the multiple quantum well light emitting layer **26** (col. 10, l. 7-12 and Figure 6B), and the second conductivity type cladding layer **28** is made of $Al_zGa_{1-z}N$ (inherently the stoichiometric coefficients of the Group III elements must add to the stoichiometric coefficient of N to achieve lowest order neutrality and chemical stability), and $0 \leq \mathbf{z} \leq 1$ (the latter double inequality does not imply any material limitation at all, merely indicating the relative abundances of Al and Ga).

On claim 10: In reference to the claim language referring to "formed by adding the p-type dopants and the n-type dopants together through an epitaxy growth" in this claim, intended use and other types of functional language must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In re Casey, 152 USPQ 235 (CCPA 1967); Also: In re Otto, 136 USPQ 458, 459 (CCPA 1963). Therefore, the further limitation as defined by claim 10 does not distinguish over the prior art.

On claim 11: In reference to the claim language referring to "formed by through a cooling rate less than 40 C /min" in this claim, intended use and other types of functional language must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In re Casey, 152 USPQ 235 (CCPA 1967); Also: In re Otto, 136 USPQ 458, 459 (CCPA

1963). Therefore, the further limitation as defined by claim 11 does not distinguish over the prior art.

5. ***Claim 7*** is rejected under 35 U.S.C. 103(a) as being unpatentable over Furukawa et al and Chen et al as applied to claim 5 above, and further in view of Wong et al (Publication in Compound Semiconductor Magazine, March 2001). As detailed above, claim 5 is unpatentable over Furukawa et al in view of Chen et al. Furthermore, the multiple quantum well layer by Furukawa et al has r=15 $\geq$ 1 InGaN well layers (col. 10, l. 10-12) and at least r=15 $\geq$ 1 InGaN barriers (col. 10, l. 10-12) (N.B.: in light of the inclusion of 0 in the admissible range for f in $In_fGa_{1-f}N$ in the original claim 7 GaN is a narrower term for InGaN within the context of Applicant's Specification), each InGaN quantum well is fabricated by $In_eGa_{1-e}N$ with e>0 (cf. col. 6, l. 6-14), and each InGaN barrier is made of $In_fGa_{1-f}N$ with $0 \leq 0=f < e \leq 1$. *Furukawa et al do not necessarily teach* the further limitation on an additional, $(r+1)^{th}$ InGaN barrier such that each InGaN quantum well is sandwiched in between two InGaN barrier layers.

However, it would have been obvious to include said further limitation in view of Wong et al (Compound Semiconductor Magazine, March 2001), who, in a publication on means to improve blue laser performance (cf. first paragraph) teach an active region with a multiple quantum well comprised of three InGaN quantum wells *sandwiched* between GaN layers (See, for instance: "Device Fabrication and Transfer", first paragraph, lines 10-12; N.B.: a difference in nomenclature by the use of "waveguide" by Wong et al instead of "barrier" as adjective does not imply any difference in material

constitution and hence without consequence for patentability questions). Application of the teaching by Wong et al to every quantum well in the collection meets the further limitation of the claim while the *combination* of the teaching by Wong et al and the invention as essentially taught by Furukawa et al is straightforward, at most requiring the addition of one barrier layer. *Motivation* for the inclusion of the teaching by Wong et al is the obvious advantage for light efficiency by restricting the width of electron motion to the De Broglie wavelength, which underlies the very concept of quantum well.

6. ***Claims 12 and 14-18*** are rejected under 35 U.S.C. 103(a) as being unpatentable over Yuasa et al (USPAT 6,586,777 B1) in view of Chen et al (6,207,972). *Yuasa et al teach* (Figures 1 and 7, title, abstract, col. 3, l. 39 – col. 5, l. 67 and col. 9, l. 6-28) a light emitting device (LED) (title) comprising:

an electrode **101** (col. 5, l. 39-40) on the n-type conductivity side (see below under description of the abutting substrate), hence, according to frequent terminology and Applicant's Specification (specifically, "Background of the Invention" with reference for n-type and p-type electrodes to Ming-Jiunn et al (USPAT 6,078,064)) qualifying as "n-type electrode";

a first conductivity type (n-type) conductive (semiconductive being a narrower term of conductive) substrate **102a** (col. 4, l. 34-39) formed over the first conductivity type electrode (N.B.: Si-doping of GaN renders the GaN material inherently n-type conductive: see, for instance col. 2, l. 44-50);

a buffer layer **103** (col. 4, l. 57) formed over said first conductivity type conductive substrate;

a first conductivity type (n-type) contact layer **105** (col. 4, l. 63-65) (N.B.: the 0.1 mm thick n-GaN layer 105 is not materially or structurally distinguished from its counterpart on the p-side, p-GaN other than through dopant type and thus qualifies as "contact" layer within the context of use of the device as a light emitting device when it serves by establishing contact between the layers abutting it, as opposed to lasing), n-type contact layer **104** (cf. col. 4, l. 60-63) (N.B.: the "cladding layers" of Chen et al clad, i.e., "cover by bonding" (see Merriam-Webster Collegiate Dictionary, 10th Edition, p.210, first column, showing synonimity between "contact" and "cladding"), which includes a contact function, and are otherwise not distinguished in this claim on either material or structure, and hence meet the claim limitation) or both (**104/105**) formed over the buffer layer;

a multiple quantum well light emitting layer **106** (col. 5, l. 3-12) formed over the first conductivity type contact layer;

a second conductivity type (p-type) contact layer **110** (col. 5, l. 35-37), **109** (col. 5, l. 20-23) (N.B.: the "cladding layers" of Chen et al clad, i.e., "cover by bonding" (see Merriam-Webster Collegiate Dictionary, 10th Edition, p.210, first column), which includes a contact function, and are otherwise not distinguished in this claim on either material or structure, and hence meet the claim limitation) or both, formed over the multiple quantum well light-emitting layer; and

an electrode **111** on the p-type conductivity side, hence, according to frequent terminology and Applicant's Specification (specifically, "Background of the Invention" with reference for n-type and p-type electrodes to Ming-Jiunn et al (USPAT 6,078,064) thus made of record by Applicant) qualifying as "p-type electrode".

Yuasa et al do not necessarily teach the further limitations on dual dopant contact layer and transparent conductive oxide layer as claimed.

However, it would have been obvious to include said further limitations in view of *Chen et al*, who, in a patent on a light emitting diode teach the inclusion of a transparent window layer (cf. title) wherein, for the specific purpose of increasing the light brightness (cf. abstract) and thus the efficiency of the light-emitting diode:

Ad (a): a dual dopant contact layer **6a** (col. 5, l. 37-48) formed over a second conductivity type (p-type) contact layer 80 (N.B.: layer 80 qualifies materially and structurally as p-type contact layer by virtue of being heavily p-doped, making more gradual the contact to fully conductive portions that inevitably are overhead, namely electrodes), the dual dopant contact layer comprising a plurality of p-type dopants and a plurality of n-type dopants (col. 5, l. 38-44) (N.B.: in light of the Specification said plurality of n-type dopants and said plurality of p-type dopants are plurality of actual atoms c.q. ions, rather than dopant atom/ion chemical type (see section [0020] of Applicant's Specification) ; and

Ad (b): a light transmitting (i.e., transparent) conductive oxide layer **6b** (cf. col. 5, l. 26-49) formed over said dual contact layer 6a (cf. Figure 6A).

Motivation to include the teaching by Chen et al in this regard in the invention by Yuasa et al derives from the increased light brightness through the inclusion of the transparent conductive oxide layer as specifically explained by Chen et al (cf. abstract), and, furthermore, through the inclusion of the dual dopant ("transition" layer 6a so as to reduce contact resistance, as also specifically explained by Chen et al (cf. abstract). *Combination* of said teaching with said invention by insertion of layers 6a and 6b between layers 110 and 111 in Yuasa et al in the vertical order according to Chen et al.

On claim 14: the multiple quantum well light emitting layer by Yuasa et al has r=3 InGaN quantum wells and r+1=4 InGaN barriers (one InGaN barrier layer is first grown, and in total four barrier layers and three quantum well layers were *alternately* formed; col. 5, l. 2-10), therefore: each $In_{0.2}Ga_{0.8}N$ quantum well is sandwiched in between two InGaN barriers, whilst each InGaN quantum is made of $In_eGa_{1-e}N$, e=0.2 (cf. col. 5, l. 5-6), and each InGaN barrier is made of $In_fGa_{1-f}N$ with f=0.05 (col. 5, l. 3), $r=3\geq 1$, and $0 \leq f < e \leq 1$.

On claim 15: in the case distinction within the rejection of claim 12 wherein the first conductivity type (n-type) contact layer is selected to be layer **104**, the LED of claim 12 by Yuasa et al and Chen et al further comprises a first conductivity type (n-type) cladding (as stated before, "cladding" and "contact" are synonymous; see comments under the rejection of claim 12 incorporated herewith) layer **105** (cf. col. 4, l. 63-65) interposed between the first conductivity type (n-type) contact layer 104 and the multiple quantum well light emitting layer 106 made of $Al_xGa_{1-x}N$ wherein $0\leq x \leq 1$, namely: GaN, i.e., x=0.

On claim 16: in the case distinction within the rejection of claim 12 wherein the second conductivity type (p-type) contact layer is selected to be layer **110**, the LED of claim 12 by Yuasa et al and Chen et al further comprises a second conductivity type (p-type) cladding (as stated before, "cladding" and "contact" are synonymous; see comments under the rejection of claim 12 incorporated herewith) layer **109** (cf. col. 5, l. 6) interposed between the second conductivity type (p-type) contact layer 110 and the multiple quantum well light emitting layer 106 made of $Al_zGa_{1-z}N$ wherein $0 \leq z \leq 1$, namely: $Al_{0.1}Ga_{0.9}N$, i.e., z=0.1.

On claim 17: In reference to the claim language referring to "formed by adding the p-type dopants and the n-type dopants together through an epitaxy growth" in this claim, intended use and other types of functional language must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In re Casey, 152 USPQ 235 (CCPA 1967); Also: In re Otto, 136 USPQ 458, 459 (CCPA 1963). Therefore, the further limitation as defined by claim 17 does not distinguish over the prior art.

On claim 18: In reference to the claim language referring to "formed by through a cooling rate less than 40 C /min" in this claim, intended use and other types of functional language must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In re Casey, 152 USPQ 235 (CCPA 1967); Also: In re Otto, 136 USPQ 458, 459 (CCPA

1963). Therefore, the further limitation as defined by claim 18 does not distinguish over the prior art.

Allowable Subject Matter

7. ***Claims 2, 6 and 13*** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: Chen et al do *not* teach the *dual dopant contact layer* to be made of a *AlInGaN-based material* (claim 2, lines 1-2, claim 6, lines 9-10, claim 13, lines 7-8) and instead impose a requirement of sufficiently narrow band gap on said dual dopant contact layer that is not obviously met for AlInGaN-based layers. The inclusion of Ga in said dual dopant contact layer by Chen et al significantly narrows the band gap in accordance with the teaching of Chen et al in compliance with the teaching by Chen et al.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Johannes P Mondt whose telephone number is 571-272-1919. The examiner can normally be reached on 8:00 - 18:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J Flynn can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JPM
November 7, 2004

Patent Examiner:

Art Unit: 2826